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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/800,543	03/06/2001	Stefan J. Burmeister	01P7507US	4163

26161 7590 03/28/2003

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EXAMINER

KAO, CHIH CHENG G

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 03/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/800,543

Applicant(s)

BURMEISTER, STEFAN J.

Examiner

Chih-Cheng Glen Kao

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☒ Claim(s) 1, 10, 12, 22, 27 and 29 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION***Claim Objections***

1. Claims 1, 10, 12, 22, 27 and 29 are objected to because of the following minor informalities. There seems to be antecedent problems created by drafting oversights in following areas: (claim 1, line 5, "the optical"), (claim 10, line 1, "the current"), (claim 10, line 2, "the light"), (claim 12, line 4, "the optical"), (claim 12, line 6, "the angle"), (claim 12, line 7, "the affects"), (claim 22, line 3, "the angle"), (claim 22, lines 3-4, "the affects"), (claim 27, line 8, "the optical"), (claim 27, line 9 "the optical"), and (claim 29, line 6, "the optical").

The following are suggestions for the corresponding areas: (claim 1, line 5, deleting "the"), (claim 10, line 1, deleting "the"), (claim 10, line 2, deleting "the"), (claim 12, line 4, deleting "the"), (claim 12, line 6, replacing "the" with - -an- -), (claim 12, line 7, replacing with - -effects- -), (claim 22, line 3, replacing "the" with - -an- -), (claim 22, lines 3-4, replacing with - -effects- -), (claim 27, line 8, deleting "the"), (claim 27, line 9, deleting "the"), and (claim 29, line 6, deleting "the").

For purposes of examination, the claim will be treated as such. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 2882

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gilliland et al. (US Patent 5812582) in view of Jiang et al. (US Patent 5757829).

3. With regards to claim 1, Gilliland et al. discloses an apparatus and method for coupling optical power into a fiber and separately monitoring optical power (Title and Figs. 1 and 2) comprising a VCSEL array with a first VCSEL (col. 4, lines 25-30) and means for monitoring optical power output (col. 5, lines 13-20).

However, Gilliland et al. does not disclose a first VCSEL and a second VCSEL coupled in parallel with monitoring the second VCSEL output.

Jiang et al. teaches a first VCSEL (Fig. 3, #12) and a second VCSEL (Fig. 3, #10) coupled in parallel with monitoring the second VCSEL output (Fig. 3, #50).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to substitute the first and second monitored VCSEL of Jiang et al. with the device of Gilliland et al., since one would be motivated by inexpensive costs and easily fabricated power monitor system and automatic power control as implied from Jiang et al. (col. 1, lines 49-65).

4. With regards to claim 2, Gilliland et al. further discloses mounting the VCSEL and means of monitoring in a TO can (col. 4, lines 25-30).

Art Unit: 2882

5. With regards to claim 3, Gilliland et al. further discloses a window through which light from the first VCSEL may pass (Fig. 1, #66).
6. With regards to claim 4, Gilliland et al. further discloses light from the first VCSEL directed into a fiber attached thereto (Fig. 1, #96).
7. With regards to claim 5, Gilliland et al. further discloses a plurality of electrical connection pin (Fig. 1, #22a, 22b, 22c).
8. With regards to claim 6, Gilliland et al. in view of Jiang et al. suggests a device as recited above.

However, Gilliland et al. does not disclose the first and second VCSELs connected to the same pins in parallel.

Jiang et al. further teaches the first and second VCSELs connected to the same electrodes in parallel (Fig. 4).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the first and second VCSELs connected of Jiang et al. to the same pins in parallel with the suggested device of Gilliland et al. in view of Jiang et al., which is explained with motivated as follows.

First, the electrodes of Jiang et al. and the pins of Gilliland et al. are considered art-recognized equivalents in that they are both leads to the VCSELs as shown in Gilliland (Fig. 1) and Jiang et al. (Fig. 4). It would have been within routine skill in the art to substitute one for the

Art Unit: 2882

other. One would be motivated to connect to pins to allow for external electrical connection as implied from Gilliland et al. (col. 4, lines 37-45).

Secondly, one would be motivated to connect the VCSELs to the same leads, pins, or electrodes to provide equal currents and emissions for monitoring as implied from Jiang et al. (col. 4, lines 1-6).

9. With regards to claim 7, Gilliland et al. in view of Jiang et al. suggests a device as recited above.

However, Gilliland et al. does not disclose the first and second VCSELs as identical.

Jiang et al. further teaches the first and second VCSELs as identical (col. 4, lines 1-6).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the first and second VCSELs identical of Jiang et al. with the suggested device of Gilliland et al. in view of Jiang et al., since one would be motivated to provide equal currents and emissions for monitoring as implied from Jiang et al. (col. 4, lines 1-6).

10. With regards to claim 8, Gilliland et al. in view of Jiang et al. suggests a device as recited above.

However, Gilliland et al. does not disclose the same power source to the VCSELs.

Jiang et al. further teaches the same power source to the VCSELs (Fig. 4).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the same power source to the VCSELs of Jiang et al. with the

Art Unit: 2882

suggested device of Gilliland et al. in view of Jiang et al., since one would be motivated to provide equal currents and emissions for monitoring as implied from Jiang et al. (col. 4, lines 1-6).

11. With regards to claim 9, Gilliland et al. further discloses a monitoring diode in the can (col. 5, lines 10-20).

12. With regards to claim 10, Gilliland et al. in view of Jiang et al. suggests a device as recited above.

However, Gilliland et al. does not disclose the current of the diode proportional to light from the second VCSEL.

Jiang et al. further teaches the current of the diode proportional to light from the second VCSEL (col. 4, lines 34-47).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have current proportional to light of Jiang et al. with the suggested device of Gilliland et al. in view of Jiang et al., since one would be motivated incorporate this for feedback control as implied from Jiang et al. (col. 4, lines 34-47).

13. With regards to claim 11, Gilliland et al. in view of Jiang et al. suggests a device as recited above.

However, Gilliland et al. does not disclose the first VCSEL emitting data in this embodiment.

Art Unit: 2882

Gilliland et al. further discloses a laser diode emitting data in the prior art (col. 1, lines 43-51).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the VCSEL emitting data of Gilliland et al. with the suggested device of Gilliland et al. in view of Jiang et al., which is explained as follows. First, the laser diode of the prior art and VCSEL are considered art-recognized equivalents in that they are both emit light for laser beams as implied by Gilliland et al. (col. 1, lines 44-51, and col. 3, lines 3-10). It would be within routine skill in the art to substitute one for another. Secondly, one would be motivated to use a laser with data as a way to transfer data as implied from Gilliland et al. (col. 1, lines 44-51).

14. With regards to claims 12, Gilliland et al. discloses an apparatus and method for coupling optical power into a fiber and separately monitoring optical power (Title and Fig. 1) comprising means for outputting (col. 4, lines 25-30) and means for monitoring optical power output (col. 5, lines 13-20).

However, Gilliland et al. does not disclose outputting data nor means for monitoring operating independent of angle of reflected light and effects of temperature thereon.

Gilliland et al. further discloses a laser diode emitting data in the prior art (col. 1, lines 43-51). Jiang et al. teaches means for monitoring operating independent of angle of reflected light and effects of temperature thereon (Fig. 3, #10, 12, and 50).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the VCSEL emitting data of Gilliland et al. with the device of

Art Unit: 2882

Gilliland et al., which is explained as follows. First, the laser diode of the prior art and VCSEL are considered art-recognized equivalents in that they are both emit light for laser beams as implied by Gilliland et al. (col. 1, lines 44-51, and col. 3, lines 3-10). It would be within routine skill in the art to substitute one for another. Secondly, one would be motivated to use a laser with data as a way to transfer data as implied from Gilliland et al. (col. 1, lines 44-51).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to means for monitoring operating independent of angle of reflected light and effects of temperature thereon of Jiang et al. with the device of Gilliland et al., since one would be motivated by inexpensive costs and easily fabricated power monitor system and automatic power control as implied from Jiang et al. (col. 1, lines 49-65).

15. With regards to claim 13, Gilliland et al. further discloses a first VCSEL (col. 4, lines 25-30).

16. With regards to claim 14, Gilliland et al. in view of Jiang et al. suggests a device as recited above.

However, Gilliland et al. does not disclose a first VCSEL and a second VCSEL coupled in parallel with monitoring the second VCSEL output, nor the same power source to the VCSELs.

Jiang et al. teaches a first VCSEL (Fig. 3, #12) and a second VCSEL (Fig. 3, #10) coupled in parallel with monitoring the second VCSEL output (Fig. 3, #50). Jiang et al. further teaches the same power source to the VCSELs (Fig. 4).

Art Unit: 2882

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to substitute the first and second monitored VCSEL of Jiang et al. with the device of Gilliland et al., since one would be motivated by inexpensive costs and easily fabricated power monitor system and automatic power control as implied from Jiang et al. (col. 1, lines 49-65).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the same power source to the VCSELs of Jiang et al. with the suggested device of Gilliland et al. in view of Jiang et al., since one would be motivated to provide equal currents and emissions for monitoring as implied from Jiang et al. (col. 4, lines 1-6).

17. With regards to claim 15, Gilliland et al. in view of Jiang et al. suggests a device as recited above.

However, Gilliland et al. does not disclose the first and second VCSELs as identical.

Jiang et al. further teaches the first and second VCSELs as identical (col. 4, lines 1-6).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the first and second VCSELs identical of Jiang et al. with the suggested device of Gilliland et al. in view of Jiang et al., since one would be motivated to provide equal currents and emissions for monitoring as implied from Jiang et al. (col. 4, lines 1-6).

Art Unit: 2882

18. With regards to claim 16, Gilliland et al. further discloses a monitoring diode (col. 5, lines 10-20).

19. With regards to claims 17, Gilliland et al. further discloses mounting the means of outputting and means of monitoring in a TO can (col. 4, lines 25-30).

20. With regards to claim 18, Gilliland et al. discloses an apparatus and method for coupling optical power into a fiber and separately monitoring optical power (Title and Figs. 1 and 2) comprising a VCSEL array with a first VCSEL (col. 4, lines 25-30) and means for monitoring optical power output (col. 5, lines 13-20), mounting the VCSEL and means of monitoring in a TO can (col. 4, lines 25-30), a window through which light from the first VCSEL may pass (Fig. 1, #66), light from the first VCSEL directed into a fiber attached thereto (Fig. 1, #96), and a monitoring diode in the can (col. 5, lines 10-20).

However, Gilliland et al. does not disclose a first VCSEL and a second VCSEL coupled in parallel with monitoring the second VCSEL output.

Jiang et al. teaches a first VCSEL (Fig. 3, #12) and a second VCSEL (Fig. 3, #10) coupled in parallel with monitoring the second VCSEL output (Fig. 3, #50).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to substitute the first and second monitored VCSEL of Jiang et al. with the device of Gilliland et al., since one would be motivated by inexpensive costs and easily fabricated power monitor system and automatic power control as implied from Jiang et al. (col. 1, lines 49-65).

Art Unit: 2882

21. With regards to claims 19 and 20, Gilliland et al. in view of Jiang et al. suggests a device as recited above.

However, Gilliland et al. does not disclose the first and second VCSELs connected to the same pins in parallel.

Jiang et al. further teaches the first and second VCSELs connected to the same electrodes in parallel(Fig. 4).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the first and second VCSELs connected of Jiang et al. to the same pins in parallel with the suggested device of Gilliland et al. in view of Jiang et al., which is explained with motivated as follows.

First, the electrodes of Jiang et al. and the pins of Gilliland et al. are considered art-recognized equivalents in that they are both leads to the VCSELs as shown in Gilliland (Fig. 1) and Jiang et al. (Fig. 4). It would have been within routine skill in the art to substitute one for the other. One would be motivated to connect to pins to allow for external electrical connection as implied from Gilliland et al. (col. 4, lines 37-45).

Secondly, one would be motivated to connect the VCSELs to the same leads, pins, or electrodes to provide equal currents and emissions for monitoring as implied from Jiang et al. (col. 4, lines 1-6).

22. With regards to claim 21, Gilliland et al. in view of Jiang et al. suggests a device as recited above.

Art Unit: 2882

However, Gilliland et al. does not disclose the first and second VCSELs as identical.

Jiang et al. further teaches the first and second VCSELs as identical (col. 4, lines 1-6).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the first and second VCSELs identical of Jiang et al. with the suggested device of Gilliland et al. in view of Jiang et al., since one would be motivated to provide equal currents and emissions for monitoring as implied from Jiang et al. (col. 4, lines 1-6).

23. With regards to claims 22, Gilliland et al. discloses a method for fabricating a device capable of coupling optical power into a fiber and separately monitoring optical power (Title and Fig. 1) and mounting a VCSEL array and means for monitoring power output in a TO can (Fig. 1, #66).

However, Gilliland et al. does not disclose means for monitoring operating independent of angle of reflected light and effects of temperature thereon, nor a first VCSEL and a second VCSEL coupled in parallel with monitoring the second VCSEL output, nor the same power source to the VCSELs.

Jiang et al. teaches means for monitoring operating independent of angle of reflected light and effects of temperature thereon (Fig. 3, #10, 12, and 50). Jiang et al. teaches a first VCSEL (Fig. 3, #12) and a second VCSEL (Fig. 3, #10) coupled in parallel with monitoring the second VCSEL output (Fig. 3, #50). Jiang et al. further teaches the same power source to the VCSELs (Fig. 4).

Art Unit: 2882

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the VCSEL emitting data of Gilliland et al. with the device of Gilliland et al., which is explained as follows. First, the laser diode of the prior art and VCSEL are considered art-recognized equivalents in that they are both emit light for laser beams as implied by Gilliland et al. (col. 1, lines 44-51, and col. 3, lines 3-10). It would be within routine skill in the art to substitute one for another. Secondly, one would be motivated to use a laser with data as a way to transfer data as implied from Gilliland et al. (col. 1, lines 44-51).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to means for monitoring operating independent of angle of reflected light and effects of temperature thereon of Jiang et al. with the device of Gilliland et al., since one would be motivated by inexpensive costs and easily fabricated power monitor system and automatic power control as implied from Jiang et al. (col. 1, lines 49-65).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to substitute the first and second monitored VCSEL of Jiang et al. with the device of Gilliland et al., since one would be motivated by inexpensive costs and easily fabricated power monitor system and automatic power control as implied from Jiang et al. (col. 1, lines 49-65).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the same power source to the VCSELs of Jiang et al. with the suggested device of Gilliland et al. in view of Jiang et al., since one would be motivated to provide equal currents and emissions for monitoring as implied from Jiang et al. (col. 4, lines 1-6).

24. With regards to claim 23, Gilliland et al. further discloses a window in the TO can through which light from the first VCSEL may pass (Fig. 1, #66).

25. With regards to claim 24, Gilliland et al. further discloses light from the first VCSEL directed into a fiber attached thereto (Fig. 1, #96).

26. With regards to claim 25, Gilliland et al. in view of Jiang et al. suggests a method as recited above.

However, Gilliland et al. does not disclose the first and second VCSELs connected to the same pins in parallel.

Jiang et al. further teaches the first and second VCSELs connected to the same electrodes in parallel (Fig. 4).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the first and second VCSELs connected of Jiang et al. to the same pins in parallel with the suggested method of Gilliland et al. in view of Jiang et al., which is explained with motivated as follows.

First, the electrodes of Jiang et al. and the pins of Gilliland et al. are considered art-recognized equivalents in that they are both leads to the VCSELs as shown in Gilliland (Fig. 1) and Jiang et al. (Fig. 4). It would have been within routine skill in the art to substitute one for the other. One would be motivated to connect to pins to allow for external electrical connection as implied from Gilliland et al. (col. 4, lines 37-45).

Art Unit: 2882

Secondly, one would be motivated to connect the VCSELs to the same leads, pins, or electrodes to provide equal currents and emissions for monitoring as implied from Jiang et al. (col. 4, lines 1-6).

27. With regards to claim 26, Gilliland et al. in view of Jiang et al. suggests a method as recited above.

However, Gilliland et al. does not disclose the first and second VCSELs as identical.

Jiang et al. further teaches the first and second VCSELs as identical (col. 4, lines 1-6).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the first and second VCSELs identical of Jiang et al. with the suggested method of Gilliland et al. in view of Jiang et al., since one would be motivated to provide equal currents and emissions for monitoring as implied from Jiang et al. (col. 4, lines 1-6).

28. With regards to independent claims 27 and 29, Gilliland et al. discloses a method for coupling optical power into a fiber and separating monitoring optical power (Title and Fig. 1) comprising a VCSEL array (col. 4, lines 25-30) and means for monitoring optical power output (col. 5, lines 13-20). Gilliland et al. further discloses light from the first VCSEL directed into a fiber attached thereto (Fig. 1, #96).

However, Gilliland et al. does not disclose a first VCSEL and a second VCSEL coupled in parallel with monitoring the second VCSEL output, nor the same power source to the VCSELs (Fig. 4), nor the first VCSEL emitting data in this embodiment.

Art Unit: 2882

Jiang et al. teaches a first VCSEL (Fig. 3, #12) and a second VCSEL (Fig. 3, #10) coupled in parallel with monitoring the second VCSEL output (Fig. 3, #50). Jiang et al. further teaches the same power source to the VCSELs (Fig. 4). Gilliland et al. further discloses a laser diode emitting data in the prior art (col. 1, lines 43-51).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to substitute the first and second monitored VCSEL of Jiang et al. with the device of Gilliland et al., since one would be motivated by inexpensive costs and easily fabricated power monitor system and automatic power control as implied from Jiang et al. (col. 1, lines 49-65).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the same power source to the VCSELs of Jiang et al. with the suggested device of Gilliland et al. in view of Jiang et al., since one would be motivated to provide equal currents and emissions for monitoring as implied from Jiang et al. (col. 4, lines 1-6).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the VCSEL emitting data of Gilliland et al. with the suggested device of Gilliland et al. in view of Jiang et al., which is explained as follows. First, the laser diode of the prior art and VCSEL are considered art-recognized equivalents in that they are both emit light for laser beams as implied by Gilliland et al. (col. 1, lines 44-51, and col. 3, lines 3-10). It would be within routine skill in the art to substitute one for another. Secondly, one would be motivated to use a laser with data as a way to transfer data as implied from Gilliland et al. (col. 1, lines 44-51).

Art Unit: 2882

29. With regards to claim 28, Gilliland et al. further discloses mounting a VCSEL array and means of monitoring in a TO can (col. 4, lines 25-30).

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (703) 605-5298. The examiner can normally be reached on M - Th (8 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



gk
March 20, 2003


ROBERT H. KIM
SUPERVISOR
TECHNOLOGY CENTER